Ex ante assessment of the potential impact of labor-intensive public works in Liberia

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EX ANTE ASSESSMENT OF THE POTENTIAL IMPACT OF LABOR INTENSIVE PUBLIC WORKS IN LIBERIA

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Apart from fiscal measures, another initiative taken by the government of Liberia to respond to the economic crisis consisted in the launch of a cash for work temporary employment program. This part of the study consists of three chapters devoted to the analysis of the program. First, in this chapter which was written before the program was actually implemented, we provide an ex ante analysis of the potential impact of such a program, relying on simulation techniques rather than on impact evaluation. The approach is very simple. We assess who may be potentially interested in participating in the public works program by identifying working individuals without pay, as well as for every level of proposed wage in the public works, those individuals who work but now earn less than the public works wage, since all these individuals may indeed be interested in participating in the program to increase their earnings. We also consider as potential beneficiaries the unemployed whose reservation wage is below the proposed public works wage. Next, we randomly select among the pool of potential beneficiaries of the program a number of participants. Finally, we estimate for the assumed participants to the program two key parameters which affect the potential impact of the program on the poor: the targeting performance of the program, and the substitution effect of the program, whereby only part of the wages paid to beneficiaries generate additional income, because at least some of the beneficiaries would probably have done other work if they had not participated in the program. The results suggest that such a cash for work program could be well targeted, but that this is by no means assured ex ante.

1. Introduction

Youth unemployment and underemployment is a major issue in sub-Saharan Africa as in many other areas of the developing world (World Bank, 2007a). In many African countries, children and youth represent up to 40 percent of the population. Thanks to programs such as the Education for All initiative, school enrolment rates are rapidly increasing, but many youth remain out of school, and are often without work or with work that do not build their skills[2].

As discussed among others in World Bank (2009) and Backiny-Yetna et al. (2011), Liberia is amongst the poorest countries in the world, with a GDP per capita of less than US$200, 64 percent of the population in poverty and nearly 48 percent in extreme poverty. Poverty is especially high in rural areas but is also widespread in urban areas. Liberia's labor force is growing rapidly due to population growth, and is for the most part unskilled due to 14 years of civil conflict. The supply of workers in the economy exceeds by a substantial margin the existing demand for workers. Due to the combined effect of unemployment, underemployment, and low productivity work for many workers, the number one priority for the government in the opinion of the population should be to create employment.

The Government of Liberia has outlined a Poverty Reduction Strategy that articulates the country's vision and major strategies for moving towards rapid, inclusive and sustainable growth

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[1] The authors are with the World Bank. This chapter was prepared in part as a background paper for a World Bank report on *Employment and Pro-Poor Growth Liberia*, and presented in Monrovia among others at a workshop in March 2011. The views expressed here are those of the authors and need not reflect those of the World Bank, its Executive Directors or the countries they represent.

[2] On skills training in Africa, see Adams (2007), Haan and Serriere (2002), Johanson and Adams (2004) and Rosholm, Nielsen and Dabalen (2007).

and development during the period 2008-2011 (Republic of Liberia, 2008). The Government has indicated that growth will be private sector-led, while the government will focus on reforming public sector institutions and processes to facilitate investment and strengthen market functions. Yet the Liberian economy's ability to create jobs in the short-to-medium-term has been adversely impacted by the confluence of the three global crises—the food crisis, the financial crisis and the commodity crisis. The crises have further compressed fiscal space, thereby limiting the government's ability to respond with counter-cyclical fiscal policy. In line with this agenda, an as a response to the global crises, the Government of Liberia is implementing a labor intensive program.

The International Labor Organization (ILO) defines employment-intensive or labor-intensive projects as those projects where labor is the dominant resource. When considering labor intensive public works to build infrastructure, a first question for policy makers is whether using this type of programs has a negative impact on the infrastructure built, as opposed to using equipment–intensive techniques. Over time, the provision of infrastructure in many countries has shifted from being predominantly labor-based to equipment-based. This shift has been particularly dramatic for developed countries where wage rates have been increasing. However, the shift is also taking place in some developing countries. Nevertheless, work done by the World Bank and the ILO has shown that for countries which are facing strong demand for infrastructure in the face of significant unemployment, labor-based provision of infrastructure remains a viable alternative to equipment-based provision of infrastructure.

Labor-intensive employment programs including public works can help Liberia not only to rebuild social and economic assets quickly, but they could also buy crucial time until the private sector expands, and the diversification strategy takes root to allow the economy to absorb a larger proportion of the labor force at reasonable wages. Labor-intensive programs should not be seen as a single "silver bullet" but as one of the elements of a comprehensive strategy which has short-term, medium-term and long-term elements to address the issue of the lack of gainful employment in Liberia. At the same time, labor-intensive public works have advantage over other strategies for infrastructure building and employment creation in Liberia.

Cross country experience with labor-intensive initiatives shows that the welfare impacts have generally been positive but the results have been mixed in terms of the quality and sustainability of the assets produced. Public employment programs were pioneered in South Asia to deal with huge open unemployment. The Maharashtra Employment Guarantee Scheme (MEGS) is known as an effective safety net for the poor in India. Bangladesh has used public employment programs since 1962, largely financed by external donors. In Sri Lanka, labor-intensive public works was used to cushion the adverse effects of structural adjustments. In Latin America, the outcome is equally positive. According to Subbarao (2003), nearly 100 percent of the participants in Chile's public works program belonged to poor households. In Argentina's *Trabajar* program, 60 to 70 percent of households participating were poor. In Sub-Saharan Africa, labor-intensive public works programs have been implemented both as free-standing programs as well as components of Social Fund programs. In general, stakeholders' views have been positive on the income and the capacity building impact of these programs. Stakeholders were particularly please at the speed with which the jobs were created although they were temporary. The public work program in South Africa, which is considered to be one of the most innovative, has multiple objectives including job creation, poverty reduction, infrastructure development, job training and community capacity building (Adato and Haddad, 2001).

What the cross-country experiences show is that projects or programs in support of labor-intensive work focus on a range of assets including roads (mostly rural but also urban), markets, schools, health centers, urban drainage systems, water supply systems, irrigation systems, reforestation, anti-erosion structures, land reclamation, housing, and solid waste management. Roads tend to be the most popular asset of choice for labor-intensive public works program across the world. Whichever assets are chosen, a critical success factor in the implementation and

sustainability of the project is the ownership by the communities. The cross-country experience clearly shows that those assets which are demand driven and reflect the choice of the communities are more likely to be better implemented and are more sustainable that those assets which are supply driven, even when the communities benefit from the jobs that are created. Social Funds have been successful at encouraging community participation. They have used different participatory tools to get communities involved in deciding priority projects, their location, design supervision of implementation and the maintenance of the projects. There has also been recent successful experimentation with community contracting (for example: the Jamaica Social Investment Fund, the Malawi Social Action Fund and Bolivia Social Fund). Beneficiary participation not only builds ownership of project but it is also an essential component of good governance.

The launch of a public works program in Liberia may appear to be a sound idea in order to help youth find employment and improve their skills. Indeed, according to lessons from a Youth Employment Inventory of 289 programs and interventions from 84 countries recently carried out by the World Bank (2007b), public works and training program are more suitable than formal sector wage subsidy programs for youth in developing countries, since wage subsidies do not go far in developing countries due to the small size of the formal wage sector and also do not reach the poor. Public works and training programs are also more likely to succeed than targeted youth entrepreneurship schemes. This is because while these schemes may improve opportunities for young entrepreneurs in low-income countries where job growth in the formal economy tends to be rare, the evidence indicates that not all youth will be well suited for self-employment and that failures rates for young entrepreneurs can be high.

However, careful targeting and screening for these programs is important to success and cost-effectiveness, and it may well be that training programs are substantially more expensive than public works program, especially if the training programs target relatively better educated workers and pay a high wage for the period of training. Training programs are also more successful when they involve the private sector in providing practical work experience and in identifying the kind of skills required. Engagement of the private sector in training is an effective tool to mitigate the risk of high-cost training disconnected from market demand and to increase on-the-job training.

In this chapter, which was originally written before the implementation of Liberia's cash for work temporary employment project, our objective was to provide some policy guidance to the Government of Liberia in its development of a more strategic approach towards achieving its pro-poor growth objectives and specifically in implementing a public works program. To provide a preliminary assessment of the potential impact of a public works program on poverty (on the impact of public works on poverty in developing countries, see among others Ravallion, 1999), we rely in this chapter on simulation techniques rather than on impact evaluation techniques. The approach is very simple. We assess who may be potentially interested in participating in the public works program by identifying working individuals without pay, as well as for every level of proposed wage in the public works, those individuals who work but now earn less than the public works wage, since all these individuals may indeed be interested in participating in the program to increase their earnings. We also consider as potential beneficiaries the unemployed whose reservation wage is below the proposed public works wage. Next, we randomly select among the pool of potential beneficiaries of the program a number of participants. Finally, we estimate for the assumed participants to the program two key parameters which affect the potential impact of the program on the poor: the targeting performance of the program, and the substitution effect of the program, whereby only part of the wages paid to beneficiaries generate additional income, because at least some of the beneficiaries would probably have done other work if they had not participated in the program.

The chapter is organized as follows. In Section 2, using recent household survey data we provide data on the potential demand for public works programs by looking at the number of

youths who are either not working but willing to work (the unemployed), or are working but with a level of pay that is below what the program provides. In section 3, we simulate the potential impact on poverty of the program through the payment of wages to the participating youths (we deliberately do not consider the additional impact which may come from the training component of the program since we do not have data to estimate its impact). The simulations take into account the likely targeting performance of the program, as well as the likely substitution effects. A conclusion follows.

2. Potential Demand for employment programs

To provide an assessment of the potential impact of labor-intensive public works on poverty in Liberia, we rely on simulation techniques using the 2007 CWIQ survey. In a similar way to Coulombe et al. (2008), the approach begins with an assessment of who may be potentially interested in participating in the program by identifying working individuals without pay, as well as for every level of the proposed wage in the program, those individuals who work but now earns less than the program wage, since all these individuals may indeed be interested in participating in the program to increase their earnings. The unemployed whose reservation wage is likely to be below the proposed program wage are also considered as potential beneficiaries. Next, we randomly select among the pool of potential beneficiaries of the program a number of participants. Finally, we estimate for the assumed participants in the program a leakage rate which represents the share of program outlays that do not directly contribute to poverty reduction. This leakage rate depends on two key parameters: (i) the targeting performance of the program, and (ii) the substitution effect of the program, whereby only part of the wages paid to beneficiaries generates additional income, because beneficiaries would probably have done other work if they had not participated in the program. Our simulations for the impact of public works on poverty are based on the assumption of a 50 percent substitution effect, so that program participants give up half their current earnings to participate in the public works program which is assumed to take place in the lean season (this may be a high substitution effect given lack of gainful employment in Liberia).

Using the 2007 Liberia CWIQ Survey, we provide in this section estimates of the number of youths aged 20 to 40 who could be interested by a national youth employment program. An analysis of the 2007 CWIQ data suggests that only a small share (less than 10 percent) of the population is likely to earn more than the minimum wage, which is US$2/day, or US$480/year. While this suggests that the targeting of public works programs would be better if wages are set lower than the minimum wage, this may not be socially and legally defensible. Therefore we consider three wage levels for the simulations: US$240, US$480 and US$720. These wages are annualized. We assume that public works participants will benefit from the program for six months per year.

The 2007 Liberia CWIQ Survey did not collect the information on individual wages. Instead, the income section considered wages for the household as a hole. Given the absence of individual data on wages, some assumption has to be made in order to estimate the actual wage of individual and to derive the reservation wage for those unemployed. For each household, the overall household wage is divided by the number wage earner to compute the individual wage. Then, a regression model was estimated to impute the reservation wage for the unemployed. Figure 1 gives the distributions of both the actual and the estimated wage. These estimates of wages are critical for the current assessment.

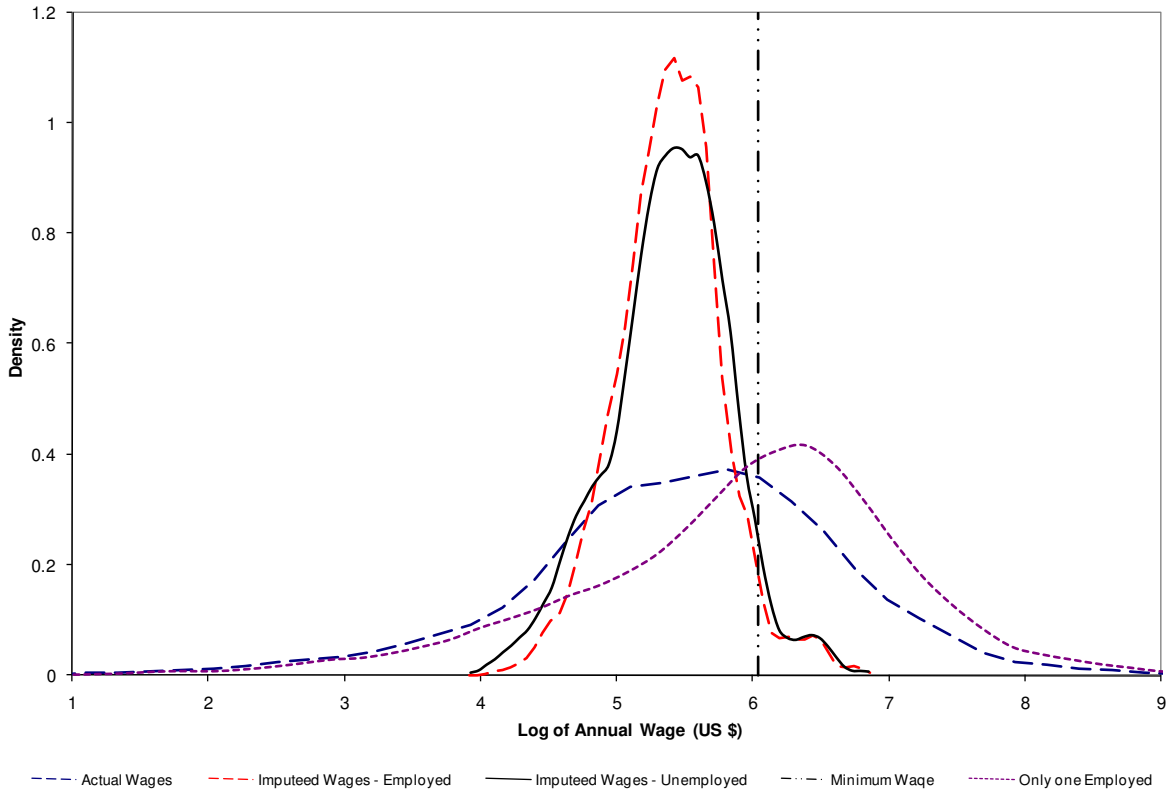
Tables 5 provide data on the distribution of earnings of individuals who are already working, as well as on the distribution of the imputed reservation wage for individuals who are unemployed and looking for work. The groups of individuals are presented in the first column of the table in terms of their annual wages in US Dollar. Table 5 enables us assess the potential population that could be interested in a job in a public works program without eligibility condition in terms of education, gender, etc.

Consider first the statistics provided in table 5. We see for example that there is a very large group of youth who are working but are paid less than half of the minimum wage (52 percent of the youths who are working at the national level are paid less than US$240/year). These individuals are likely to be interested in public works. Clearly, some may not apply for such a program due to various constraints (they may not be paid, but still doing important work that has to be done for their household, and hence they may not be able to participate in the program). Also, depending on the wage paid by public works, additional individuals could be interested in participating in the program if their current wage is below that proposed by the program. We cannot identify those who would actually be interested and those who would not. But for the purpose of the simulations in the next section, all the individuals unpaid for their work, as well as all individuals who earn less than the proposed wage are potential beneficiaries of the program, and we can randomly chose some of these individuals as participants in public works for each proposed wage level in order to simulate the impact of the program on poverty. Finally, among the unemployed, those who have a reservation wage below the proposed wage would also be potential beneficiaries.

The estimates in table 5 therefore give us an upper bound for the potential number of youths that might be interested in a public works program, depending on the wage provided in the program, and without any eligibility condition as it may be proxied by the gender, the education level or other individual characteristic. Figures 2 to 4 summarize the data on the potential number of participants by quintiles of per capita consumption of the households to whom the individuals who are potential beneficiaries belong. This is done for three potential wage levels, from US$240 per year to US$720 per year.

Two findings stand out from the results presented in Figure 2 to 4. First, the number of individuals who could potentially be interested in the program appears to be very large, especially because many workers are working with low pay (observed or imputed) and might therefore be interested in getting higher cash income through public works. Second, the targeting performance or likely benefit incidence of the program depends on whether the program is implemented mostly in urban or rural areas. In urban areas, the program would probably be regressive, since most of the potential beneficiaries belong to the better off quintiles of the population (this is because urban households tend to have higher levels of consumption than rural households, so that relatively few households in urban areas belong to the bottom quintiles). By contrast, the programs could be well targeted to individuals belonging to households which tend to be poor if the focus is placed on providing employment and reconstructing infrastructure in rural areas. There is also a clear relationship between the wage level of workers and the poverty status of households.

Figure 7.1: Distribution of actual wage and imputed wage, Liberia 2007



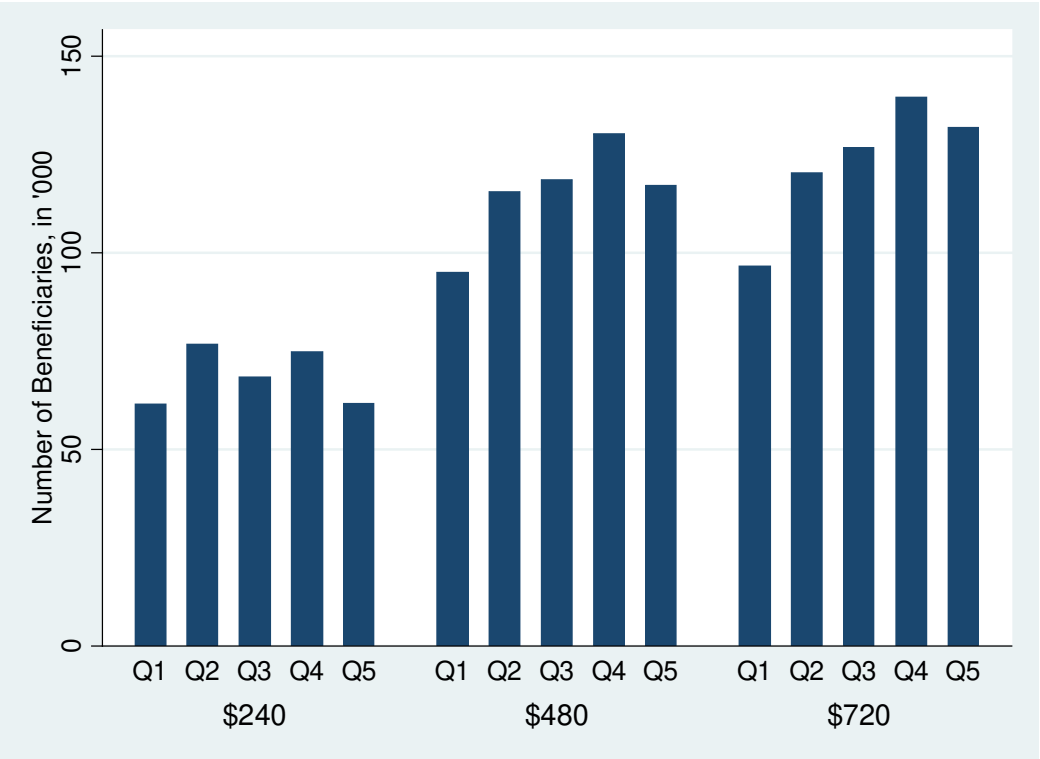
Source: Authors' estimation using 2007 CWIQ data.

Table 7.1: Potential Beneficiaries of Publics Works among individuals aged 20-40, National, 2007

	Wage of workers					Unemployed reservation wage				
	% Group	#people Group	Annual Wage	Weekly Hours	% Poor	% Group	#people Group	Imputed Annual Wage	Weekly Hours	% Poor
Liberia										
< $42	5.6	32377.7	1299.7	45.2	73.2	-	-	-	-	-
$42 - $70	2.5	14513.8	4065.6	50.3	60.2	0.2	129.7	4687.2	-	100.0
$70 - $98	3.7	21253.4	6133.8	47.1	79.7	3.7	2976.8	6418.5	-	70.0
$98 - $140	9.8	57138.7	8718.1	40.2	67.2	10.3	8346.2	8680.1	-	59.0
$140 - $210	31.3	181690.0	12542.0	43.8	65.4	31.3	25361.8	12645.7	-	64.4
$210 - $280	20.9	121557.0	17298.4	46.9	60.9	31.6	25611.7	17232.3	-	64.7
$280 - $350	7.9	45818.3	22085.9	48.7	59.4	16.1	13023.0	22281.9	-	58.7
$350 - $420	4.2	24594.4	27299.4	45.2	58.3	3.6	2918.0	26449.2	-	71.6
$420 - $490	2.6	14947.0	32710.8	46.4	39.1	2.4	1930.0	32322.3	-	36.6
$490 - $560	2.5	14284.1	36989.1	51.2	57.2	0.2	147.8	35300.8	-	100.0
$560+	9.1	52966.0	84797.8	49.0	28.7	0.7	560.0	43864.2	-	42.7
Total Liberia	100.0	581140.0	21170.7	45.6	60.5	100.0	81004.8	16218.1	-	62.8
Urban										
< $42	10.0	15180.8	1073.7	42.6	56.7	-	-	-	-	-
$42 - $70	4.3	6549.9	4177.0	54.3	51.3	0.3	129.7	4687.2	-	100.0
$70 - $98	7.2	10934.8	6210.3	45.9	75.3	6.3	2844.3	6408.0	-	68.6
$98 - $140	7.9	11978.5	8590.9	45.9	65.4	11.6	5250.7	8554.7	-	64.9
$140 - $210	14.3	21755.6	12967.1	45.6	47.8	16.6	7521.1	13092.7	-	71.6
$210 - $280	16.3	24687.8	17471.7	43.9	51.3	31.8	14361.2	17431.6	-	60.3
$280 - $350	8.6	13060.1	22407.1	46.9	41.8	22.3	10100.5	22361.1	-	50.1
$350 - $420	5.5	8350.6	27383.2	47.1	39.1	5.6	2546.7	26523.1	-	68.5
$420 - $490	4.0	6130.0	32673.7	47.5	36.9	3.9	1761.7	32229.9	-	40.1
$490 - $560	2.8	4182.8	37542.8	50.9	38.0	0.3	147.8	35300.8	-	100.0
$560+	19.1	28967.2	101128.6	51.0	21.6	1.2	560.0	43864.2	-	42.7
Total Urban	100.0	151778.0	31203.2	46.9	46.1	100.0	45223.6	17524.6	-	60.7
Rural										
< $42	4.0	17196.9	1499.3	47.5	87.8	-	-	-	-	-
$42 - $70	1.9	7963.9	3974.1	47.1	67.6	-	-	-	-	-
$70 - $98	2.4	10318.6	6052.6	48.4	84.3	0.4	132.4	6643.9	-	100.0
$98 - $140	10.5	45160.3	8751.8	38.7	67.7	8.7	3095.5	8893.0	-	49.0
$140 - $210	37.2	159934.0	12484.2	43.6	67.8	49.9	17840.7	12457.3	-	61.3
$210 - $280	22.6	96868.9	17254.3	47.7	63.3	31.4	11250.4	16977.9	-	70.3
$280 - $350	7.6	32758.2	21957.9	49.4	66.5	8.2	2922.5	22008.5	-	88.5
$350 - $420	3.8	16243.8	27256.3	44.2	68.2	1.0	371.3	25941.7	-	92.6
$420 - $490	2.1	8817.0	32736.5	45.5	40.5	0.5	168.4	33289.5	-	0.0
$490 - $560	2.4	10101.4	36759.8	51.3	65.2	-	-	-	-	-
$560+	5.6	23998.8	65086.0	46.6	37.2	-	-	-	-	-
Total Rural	100.0	429362.0	17624.2	45.2	65.6	100.0	35781.2	14566.9	-	65.5

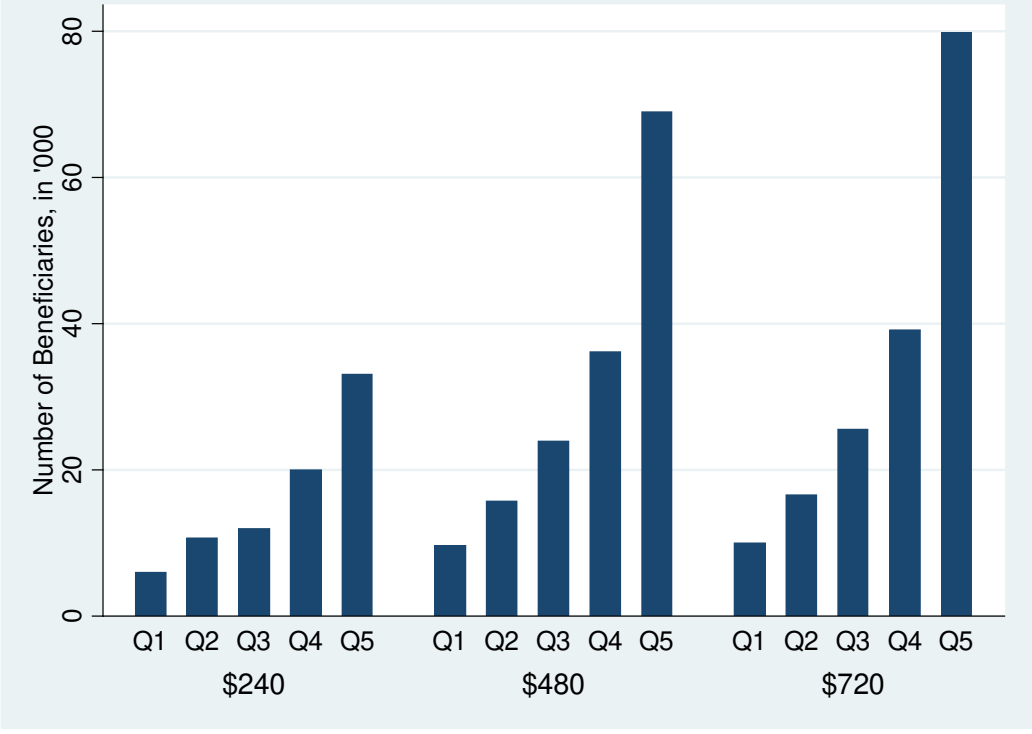
Source: Authors' estimation using 2007 CWIQ data.

Figure 7.2: Distribution of potential beneficiaries of public works, National



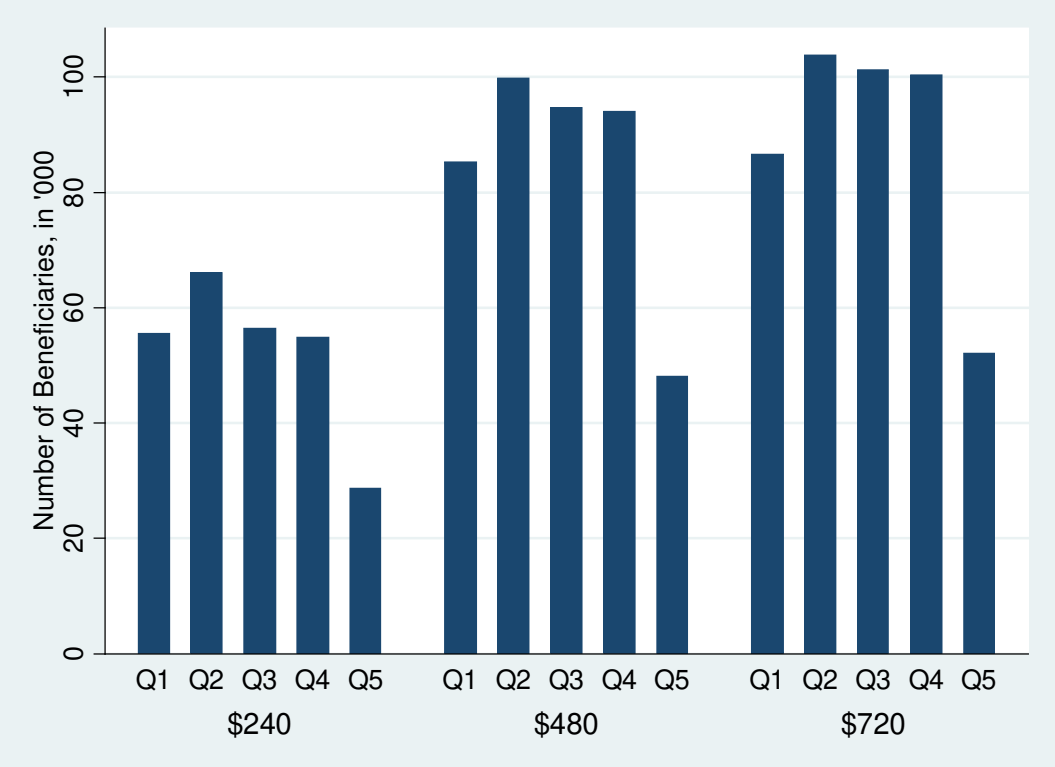
Source: Authors' estimation using 2007 CWIQ data.

Figure 7.3: Distribution of potential beneficiaries of public works, Urban



Source: Authors' estimation using 2007 CWIQ data.

Figure 7.4: Distribution of potential beneficiaries of Public Works, Rural



Source: Authors' estimation using 2007 CWIQ data.

4. Potential Poverty Impact of Public Works

The cost of a public works program would depend on the number of beneficiaries and the wages paid to program participants. An analysis of the 2007 CWIQ data suggests that only a small share (less than 10 percent) of the population is likely to earn more than the minimum wage, which is US$2/day, or US$480/year. While this suggests that the targeting of public works programs would be better if wages are set lower than the minimum wage, this may not be socially and legally defensible. Therefore we consider three wage levels for the simulations: US$240, US$480 and US$720. These wages are annualized. We assume that public works participants will benefit from the program for six months per year. Table 6 provides simple estimates of the potential cost of the program under three scenarios for the number of beneficiaries. Under the first scenario, the program would reach 50,000 beneficiaries, and its cost would then range from US$6.9 million (0.8 percent of GDP) assuming program wages of US$240 per year or about half the minimum wage, to US$20.7 million (2.3 percent of GDP) assuming program wages of US$720 or about 150 percent of the minimum wage. Under a second scenario, the program would reach 100,000 beneficiaries at a cost ranging from US$13.8 million (1.5 percent of GDP) to US$41.4 million (4.6 percent of GDP). These costs include wage cost and administrative costs, but do not cover the other costs of public works in terms of materials for construction purposes.

In order to assess the potential impact of the public works program, on the basis of the numbers of jobs created, we randomly select among all potential beneficiaries of the program (the number of which depends on the wage provided) a number of participants so as to match the distribution of the actual program participants. This is done for each of the wages assumed to be provided. The results of this procedure and the related statistics on targeting performance are provided in table 7 for poverty headcount and table 8 for extreme poverty headcount.

Consider first table 7 which provides data for public works program potential participants given the poverty headcount. The first column provides the estimate of the total number of potential beneficiaries of the program depending on the wage level, as estimated from table 5. For example, at a wage level of US$240/year, 165,281 individuals in the North Central region might be potential beneficiaries of public works according to our method for identifying such potential beneficiaries. The second column provides the share of those individuals living in households who are poor. For example, at a wage of US$240/year, 68.9 percent of the potential beneficiaries in the North Central region live in a household in poverty according to the definition of poverty used by the Liberia Institute of Statistics and Geo-Information Services (see Backiny-Yetna and al., 2011). The third column provides the additional wage to be obtained by each individual, on average, depending on the wage proposed for the program. At a wage of US$240/year, out of that amount, on average US$73.6 represents additional income for potential participants to the program in the North Central region.

The next column provides the leakage rate, which is computed as the product of the poverty rate times the additional wage divided by the reference wage of the program. The leakage rate represents the share of program outlays that do not directly contribute to poverty reduction. This leakage rate depends on two key parameters: (i) the targeting performance of the program, and (ii) the substitution effect of the program, whereby only part of the wages paid to beneficiaries generates additional income, because beneficiaries would probably have done other work if they had not participated in the program.

If the public works program is implemented with an annual wage of US720, the leakage rate for poverty is estimated in Monrovia at 58.0 percent, and for extreme poverty the estimate is at 80.2 percent. These are relatively high leakage rates because the share of those participating in the public works program that are poor or extreme poor is lower in the capital than elsewhere. Overall, however, the variation in leakage rates between the various wage levels is not very high. This is because a higher wage levels implies less targeting to the poor, but on the other hand it reduces the substitution effect through which part of the gains from the public works wage are lost due to the need to give up other work. In terms of results for the country as a whole, at a wage rate of US$240 per year, the overall leakage rate is 52.4 percent, and it remains between 45.4 percent and 52.4 percent when we change the wage rate. However, as already mentioned, the leakage rate is systematically higher in Monrovia than elsewhere, because the share of participants in the program that are poor or extreme poor is lower in the capital. In contrast, the leakage rates are lowest in the South eastern area of the country, where poverty and extreme poverty are higher.

Table 7.2: Estimates of project cost (wages and administrative costs), 2007

Parameters	**Scenario I**			**Scenario II**		
Beneficiaries	50,000	50,000	50,000	100,000	100,000	100,000
Min. Wage (US$)				----480----		
Paid wage (US$)	240	480	720	240	480	720
% minimum wage	50%	100%	150%	50%	100%	150%
Employment duration				---6 Months---		
Cost (US$M)	6	12	18	12	24	36
Adm. cost 15%	0.9	1.8	2.7	1.8	3.6	5.4
Total cost (US$M)	6.9	13.8	20.7	13.8	27.6	41.4
Cost/GDP (%)	0.8%	1.5%	2.3%	1.5%	3.1%	4.6%
GDP (US$M)	904.35	904.35	904.35	904.35	904.35	904.35

Source: Authors' estimation using 2007 CWIQ data.

Table 7.3: Potential leakage of Public Works for Poverty Headcount, 2007

				Part time and partial substitution		Full time and full substitution	
	Region	#of people	Poverty Headcount in%	Additional Wage In US $ yearly	Leakage Rate in%	Additional Wage In US $ yearly	Leakage Rate in%
$240	Greater Monrovia	37,331	50.9	79.6	60.8	108.5	72.5
	North Central	165,281	68.9	73.6	51.5	84.3	72.0
	North Western	27,198	74.2	66.0	53.1	54.0	80.5
	South Central	71,549	63.4	78.4	52.0	103.8	67.4
	South Eastern A	24,242	78.9	72.4	45.5	79.4	69.9
	South Eastern B	17,652	68.6	70.5	52.8	72.1	74.3
	Total	343,252	66.9	74.4	52.4	87.6	71.7
$480	Greater Monrovia	101,082	49.9	173.9	57.9	275.7	65.6
	North Central	229,512	67.9	168.6	45.5	254.4	58.8
	North Western	61,478	73.7	158.4	44.4	213.5	62.4
	South Central	87,877	58.9	176.6	49.4	286.3	57.7
	South Eastern A	54,203	74.4	163.6	41.2	234.2	56.9
	South Eastern B	42,298	67.3	164.8	46.1	239.2	59.5
	Total	576,450	64.5	168.9	47.8	255.6	60.1
$720	Greater Monrovia	114,643	47.6	270.9	58.0	453.8	63.7
	North Central	241,544	67.2	269.3	42.3	447.3	51.9
	North Western	63,901	73.0	260.6	39.4	412.3	51.8
	South Central	93,311	57.7	276.3	48.4	475.3	54.5
	South Eastern A	57,130	74.1	264.3	37.2	427.1	48.6
	South Eastern B	44,696	66.8	266.0	42.9	434.1	52.7
	Total	615,224	63.3	269.1	45.4	446.3	54.2

Source: Authors' estimation using 2007 CWIQ data.

Table 7.4: Potential leakage of Public Works for Ext. Poverty Headcount, 2007

				Part time and partial substitution		Full time and full substitution	
	Region	#of people	Ext. Poverty Headcount in%	Additional Wage In US $ yearly	Leakage Rate in%	Additional Wage In US $ yearly	Leakage Rate in%
$240	Greater Monrovia	37,331	24.5	79.6	81.1	108.5	86.6
	North Central	165,281	57.2	73.6	59.9	84.3	77.0
	North Western	27,198	59.9	66.0	62.2	54.0	84.4
	South Central	71,549	45.8	78.4	65.7	103.8	77.1
	South Eastern A	24,242	61.3	72.4	58.0	79.4	77.4
	South Eastern B	17,652	53.5	70.5	63.8	72.1	81.2
	Total	343,252	51.6	74.4	63.7	87.6	78.9
$480	Greater Monrovia	101,082	24.1	173.9	80.1	275.7	84.2
	North Central	229,512	55.0	168.6	55.5	254.4	66.1
	North Western	61,478	59.1	158.4	55.4	213.5	69.8
	South Central	87,877	41.2	176.6	64.5	286.3	70.1
	South Eastern A	54,203	58.9	163.6	53.2	234.2	65.4
	South Eastern B	42,298	51.4	164.8	58.5	239.2	68.5
	Total	576,450	48.0	168.9	61.2	255.6	70.4
$720	Greater Monrovia	114,643	22.6	270.9	80.2	453.8	83.0
	North Central	241,544	54.5	269.3	53.1	447.3	60.7
	North Western	63,901	58.1	260.6	51.6	412.3	61.4
	South Central	93,311	40.2	276.3	63.9	475.3	68.0
	South Eastern A	57,130	58.0	264.3	50.5	427.1	59.1
	South Eastern B	44,696	51.1	266.0	56.2	434.1	63.5
	Total	615,224	46.8	269.1	59.6	446.3	66.1

Source: Authors' estimation using 2007 CWIQ data.

The estimated potential impact of the program on poverty is given in table 9. The estimates are obtained in a very simple way. For the participants in the program who belong to households living in poverty, we add to the consumption aggregate of the household the gains in earnings obtained by the participants, and we recomputed poverty using the same poverty lines (for a discussion of poverty measurement in Liberia, see Backiny-Yetna and al, 2011). In other words, we assume that the full amount of the earnings gains for program participants translate into additional consumption for their households. Our simulations for the impact of public works on poverty are based on the assumption of a 50 percent substitution effect, so that program participants give up half their current earnings to participate in the public works program which is assumed to take place in the lean season. For higher wages, the impact is higher, since the additional earnings obtained by participants are higher.

With the provision of 50,000 jobs and assuming annual public works wage of US$720 (each workers then gets US$360 over a six month period) the headcount index of poverty is reduced by 15.6 percentage points among program beneficiaries. The reduction in the headcount for the population as a whole is 1.61 percentage point. The impact on extreme poverty is similar. While a reduction in the headcount index of poverty of less than two percentage points may not appear to be very large as compared to the existing share of the population in poverty (at 64 percent), this is still not negligible and a large share of the population would benefit from improvements in standards of living through the public works program. When 100,000 jobs are created, the impact on poverty is about twice that of the impact with 50,000 jobs

Table 7.5: Potential impact of public works for the reduction of poverty, National, 2007

	Beneficiaries		Whole population	
	Headcount	Poverty Gap	Headcount	Poverty Gap
	Impact on poverty, 50,000 jobs			
$240	3.33	3.29	0.35	0.34
$480	10.16	6.85	1.05	0.71
$720	15.61	10.06	1.61	1.04
	Impact on extreme poverty, 50,000 jobs			
$240	3.40	3.01	0.36	0.31
$480	10.08	6.02	1.04	0.62
$720	16.07	8.62	1.66	0.89

Source: Authors' estimation using 2007 CWIQ data.

5. Conclusion

Job creation is an imperative for the new Government of Liberia. Fourteen years of civil conflict has not only destroyed the social and economic infrastructure base but it has also grounded the economy to a virtual halt and has consequently resulted in large scale unemployment and significant poverty. Growth has picked up since the signing of the Accra Comprehensive Peace Agreement in 2003, spurred in part by increasing foreign direct investment in traditional sectors. However, the current rate of job creation in these sectors, even under the most optimistic scenario, is unlikely to absorb a significant portion of the unemployed and underemployed labor force in the short-term. The lack of gainful employment, including for many unskilled youth (whose education was terminated by the conflict) as well as ex-combatants, poses a significant risk to maintaining peace. One of the major challenges facing the Government is to devise a strategic response to address the immediate employment situation in the context of establishing a strategic framework for more sustainable, long-term jobs created by the private sector. The strategy for job creation that is ultimately adopted by the Government should reflects its social, economic and political needs; its administrative capacity to manage the implementation of the strategy; and the viability of the strategy in terms of it financial and political sustainability given the current and evolving fiscal space and the political situation.

In terms of strategy options, labor-intensive public works appear to be the most natural fit to the current situation in Liberia. Labor-intensive public works can respond to the country's dual needs to: (i) create social and economic assets to improve welfare and help create the environment for private sector led growth; and (ii) provide employment for a large number of unskilled workers including women and youth. Wage subsidy schemes may be less appropriate for the current situation in Liberia given the public and private sectors' limited capacity to absorb additional labor in the short-term. Furthermore, targeted wage subsidy schemes are administratively more difficult to administer and generalized schemes would be more expensive.

The opportunities for labor-intensive public urban and rural works cover rehabilitation or reconstruction of schools, health centers and other small civil works as well as the management of solid waste. Also on roads, low-volume community and feeder roads also lend themselves to labor-intensive works both for construction and maintenance. Some aspects of the maintenance of high volume, highway roads also lend themselves to labor-intensive operation. However, re-construction of critical high-volume roads with machine surface finish, lend themselves less to labor-intensive operation. In any case, these are also the roads which need to be delivered quickly to crowd in private sector investment. Of the current road network of about 10,000 km, about half of which may be suitable for labor-intensive operation.

The cost of a public works program in Liberia would vary greatly depending on its size and the wages paid. For example, a program providing six months of employment to 50,000 beneficiaries would cost from US$6.9 million (0.8 percent of GDP) with a very low public works wage of US$240 per year (or about half the minimum wage) to US$20.7 million (2.3 percent of GDP) with a wage of US$720 per year (or about 150 percent of the minimum wage). This cost includes wage costs and administrative costs, but not other costs in terms of materials for construction purposes. A program with 50,000 jobs at an annual wage of US$720 would reduce the share of the population in poverty by about 15.6 percentage points among program beneficiaries and 1.61 point in the population as a whole. The impact on extreme poverty is similar. While this may not seem large, a large share of the population would benefit from improvements in standards of living through the program.

Our simulation suggested that the number of individuals who could potentially be interested in the program appears to be very large, especially because many workers are working with low pay (observed or imputed) and might therefore be interested in getting higher cash income through public works. The targeting performance or likely benefit incidence of the program depends on whether the program is implemented mostly in urban or rural areas. In urban areas, the program would probably be regressive, since most of the potential beneficiaries belong to the better off quintiles of the population (this is because urban households tend to have higher levels of consumption than rural households, so that relatively few households in urban areas belong to the bottom quintiles). By contrast, the programs could be well targeted to individuals belonging to households which tend to be poor if the focus is placed on providing employment and reconstructing infrastructure in rural areas.

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